Experiments

- $15 to $25 million
- Start small & cheap
- Component vs. system
- KC-135, Shuttle, Space Station
- Miniature demonstration/development of technologies, can do component demo as long as leading to leads to the overall goal
- Stretch lens experiment, lens coatings, UV protection, life in orbital environment
- Deploy a large diameter reflector
  - Measure flatness (curvature) of surface
  - Reaction of surface flatness to control disturbances
- Direct drive electric propulsion
  - 11x14 inches, 3000 volts
  - Use small spacecraft to deliver hardware
  - Various power sources
- Direct drive free-flyer to demonstrate high voltage direct drive & delivery of robots/structural elements to various destinations (Brian Reed, Boeing)
  - Hall thruster
  - Deliver robots
  - Power beaming to satellite during eclipse
  - Single junction
  - Triple junction HV
  - Recoverable

- Micro-satellite, high voltage/low voltage, inflatable arrays
-
- Demonstrate automated rendezvous & docking
- Low altitude GPS, high altitude position & attitude sensing

Develop data for the technology areas of:

- Power generation
  - Can be demonstrated on ground
  - In orbit: do sun tracking, controls, dynamics, orbital stability, pointing, gimbals & roll rings
- Structures, control, mechanisms, dampening (memory metals, smart structures…), inflatables (plastic, metals), rigidization, stresses
  - Size is a challenge, large dia. Optics
  - Packaging
  - Environmental impacts
  - Biggest problems is materials
  - Charge deposition, plasma interactions
  - Position & orientation control
    - Thrusters produce disturbances, contamination
    - At geosync major requirement is countering light/solar wind pressure, may require constant ion engine firing
- Robotics
  - Active sensors
  - Lighting

  - Interactions
  - Motors/micro-thrusters
  - Position definition/knowledge, geosync GPS, ranging, attitude knowledge,
- WPT
  - Lasers/microwaves
  - Lasers
    - Space to ground
      - Atmospheric propagation
        - Dry air, wet air, clouds, dust storms
    - Space to space
      - Target acquisition
- Gimbals
- In LEO
  -
- In a higher orbits
- Transportation
  - Micro-thrusters
  - Contamination on components/disturbances